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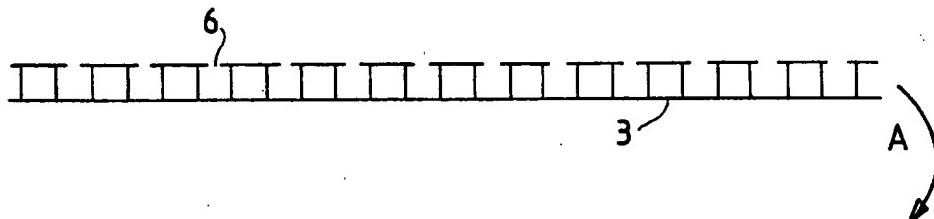
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International Bureau



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(54) Title: SHEET MATERIAL DISPLAY PANEL



(57) Abstract

A display means and panels comprising corrugated or fluted sheet material having display and support surfaces in which cuts or slits (6) are made in one or both surfaces so as to make the material rollable. The plurality of slits or cut-outs (6) are in the same axis as the corrugations or flutes. The cuts or slits in the display means and panels may be formed by means of a cutting tool adapted to slit or cut the corrugated or fluted sheet material. A guide can control the one or more blades of the cutting tool into contact with the one or more respective corrugations or flutes. A cutting tool is also claimed.

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SHEET MATERIAL DISPLAY PANEL

This invention relates to improvements in displaying means and panels and means of cutting display means and panels therefor and more particularly, but not exclusively to a sheet-type material and cutting tool therefor.

To the present time, various types of display devices and panels have been commercially available but to varying degrees have suffered from the disadvantage of being heavy and cumbersome and difficult to store and transport. In particular, existing display devices and panels may be heavy and require backing to the sheet metal or other inflexible substrate to maintain its rigidity. Furthermore, the frames necessary to house such displays and panels may themselves be heavy and expensive and accordingly difficult to transport and erect. In the case of display devices used in exhibitions and the like, the visual presentation is important and while certain display devices currently available meet certain expectations in the marketplace, the advantages referred to above, make them unwieldy and expensive.

It is thus an object of the present invention to provide a display means or panels and a method for preparing the said display means or panels, which can provide a relatively simple and effective display means and method thereof. In

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the case of the preferred embodiments, the object of the invention is to achieve a display means which is able to provide in use a substantially rigid surface to carry the necessary display, but which can also be readily transported and stored.

It is a further object of the present invention to provide display means and panels which overcome or at least obviate disadvantages in the display means and panels available at the present time or at least will provide the public with a useful choice.

Further objects of the present invention will become apparent from the following description.

According to one aspect of the present invention, there is provided a display means comprising corrugated or fluted sheet material having a display surface and a support surface, wherein one or both surfaces have a plurality of cut-outs or slits provided substantially in the same axis as the corrugations or flutes so as to enable said display means to be rollable.

According to a further aspect of the present invention, there is provided a display means comprising corrugated or fluted sheet material having a display surface and a support surface in which one or both surfaces have a plurality of

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cut-outs or slits provided substantially in the same axis as the corrugations or flutes and wherein an adhesive means is applied to the display surface and thereafter a print or other image substrate is adhered to the display surface.

According to a further aspect of the present invention, there is provided a display means as aforesaid wherein the said support surface has a plurality of cuts or slits in the said surface in the same axis as the corrugation or flutes, so as to reduce the surface tension of the said support surface and render the sheet material non-rigid unless otherwise framed or secured and at such time to provide a substantially planar display surface.

According to a further aspect of the present invention, there is provided a panel means comprising corrugated or fluted sheet material wherein one or both surfaces have a plurality of cut-outs or slits provided substantially in the same axis as the corrugations or flutes so as to enable said panel means to be deformably erected.

According to a further aspect of the present invention, there is provided a cutting tool for slitting or cutting a corrugated or fluted sheet material comprising a guide means, engageable within at least one corrugation or flute, and at least one blade means controllable by said guide means to

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engage with and slit or cut the or a respective corrugation or flute.

Further aspects of this invention, which should be considered in all its novel aspects, will become apparent from the following description, given by way of example or possible embodiments thereof and in which reference is made to the accompanying drawings.

Figure 1: shows a cross-sectional end view of a display means according to one possible embodiment of the invention showing a single slit in each corrugation in only one surface of the display means.

Figure 2: shows a display means according to Figure 1 in the same cross-sectional end view wherein channels are cut into every second corrugation or flute in only one surface of the display means.

Figure 3: shows a display means according to Figure 1 in the same cross-sectional end view wherein channels are cut into every second corrugation or flute on both surfaces of the display medium.

Figure 4: shows a perspective view of the corrugated or fluted sheet materials.

Figure 5: shows a cross-sectional view of the display means wherein no channels have been cut having a print or image substrate mounted on the display side.

Figure 6: shows a cross-sectional view of the display means wherein channels are cut in every second

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corrugation or flute on both surfaces having a print or image substrate mounted on the display surface.

Figure 7: shows a side view of a possible embodiment of the cutting tool.

Figure 8: shows an end view of the cutting tool of Figure 7.

Figure 9: shows a side perspective view of a possible embodiment of the cutting tool in which six cutting blades are mounted in parallel.

The present invention relates to display means and a method of forming or otherwise cutting the display means which in one embodiment thereof is particularly suitable for use in sheet type display means for promotional and advertising purposes. However, it is to be appreciated that the present invention has applications wherever the varied and efficient direction of display materials is required whether for temporary or permanent purposes.

It will also be appreciated that the present invention is adapted for the display of a variety of types of display means. For the purposes of this specification, such means may be described as various types of sheet-like material which include photographic materials, laminated photographic materials, self-screen materials, off-set printed materials and other image substrates.

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While reference is made to "sheet materials", it will be appreciated that such materials may be retained in a substantially planar form or other embodiments formed into any possible shaped form, for example a tubular column. Such shaped forms may be achieved for example by means of a template allowing varied and efficient display purposes.

Likewise, the panel means of the present invention may comprise a deformable sheet material adapted for use in modelling, building or construction, for example, in creating shaped or contoured formations. Accordingly, the panels may be used as a die or mould, for example, in forming concrete or plastic structures or in a permanent structure of a desired shape.

Referring firstly to Figure 4, a corrugated or fluted sheet material is referenced by 1, which shows a plurality of corrugations or flutes 2, it is seen that such flutes run parallel one to the other. The sheet material comprises a continuous display surface 3 and a support surface 4. It will be appreciated that in the Figure 4 embodiment, the support surface is continuous rather than non-continuous as required in the invention. The sheet material has a layer of fastening means such as VELCRO (Trade Mark) 5 which is shown to be inserted in a channel in the support surface 4, so as to be flush with the said surface. Surface 4 may be used to secure the sheet material to either another sheet of material

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or like securement means. In this way, the sheet material may be maintained in a rigid state for display purposes.

Figure 1 shows a cross-sectional end view of the sheet material. Display surface 3 is to be shown to be substantially continuous while support surface 4 is shown to be non-continuous, having a plurality of cut-outs or slits 6. In the embodiment, each corrugation or flute has a cut or slit in the rear surface.

In the case of Figure 2, it is seen that the cuts or slits 6 are in every second corrugation or flute.

It will be appreciated that the Figure 1 and Figure 2 embodiments are simply two examples of how the support surface may be cut. It will be seen that a cut or slit may be placed in every third or fourth corrugation, or for that matter, whichever corrugation is required, whether those corrugations be on one or other or both surfaces.

In the case of Figure 3, it will be seen that the cuts or slits 6 are in every second corrugation or flute on both surfaces, the continuous sheet being maintained by alternating the cuts on either surface.

By making the aforesaid cuts or slits in either one or both surfaces, the surface tension of the surfaces is

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reduced. Accordingly, the sheet material 1 may be rolled in the direction of A in Figure 2 or in either direction in Figure 3.

The cut-outs or slits may range in the case of relatively small display mean from approximately 0.1 mm to 2 mm each. In the case of larger panels the slits may themselves be larger. The width of the cut-out or slit will vary depending on the degree to which the sheet material needs to be rolled. Obviously, if it is to be desirable to roll the sheet material into a column for storage, the slits will need to be relatively wide. If on the other hand, it is only necessary for the sheet material to be rendered into an arcuate shape, then very narrow slits only will be required.

In the case of corrugated or fluted sheet material, indentations in both the rear support surface and display surface 7 occurs. This is shown in Figure 5. In the case of display materials, such as off-set printing paper, these materials will show up the said indentation. This results in an unsatisfactory appearance in the display material. To avoid this difficulty, an adhesive or carrier sheet coated on both sides with adhesive may for example be applied to the display surface 3 and thereafter a print 8 stuck to the display surface. It will be appreciated that the Figure 4 embodiment might be adapted for a variety of types of display mediums, such mediums including photographic materials,

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laminated photographic materials, self-screen materials, offset printed materials and other image substrates.

Figure 6 shows the print or image substrate 8 covered by a layer of plastic laminate 9, adhering to a carrier sheet coated on both sides with adhesive 10, which in turn is applied to the display surface of the display means 3.

In order to place the cuts or slits 6 in the support surface, a cutting tool is required. Figures 7 and 8 show such a tool for cutting a single slit or cut. The cutting tool 9 has a handle 10, blade 11, adjustment means 12 and guide means 13.

Figure 9 is a side perspective view of a further possible embodiment of the cutting tool with three guide means 13. Each guide means can be seen to have two cutting blades 11a and 11b positioned either side, parallel to each other and rearwardly adjacent to guide means 13.

In this embodiment the handle is integrally formed with and positioned substantially perpendicular to the guide means 13. Blade means 11a and 11b attached to cutting tool 9 by way of nut and bolt as shown in Figures 7 and 8.

In use, the guide means 13 may be placed in any one flute or corrugation. The cutting tool may then be drawn

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towards the user. The two blades 11(a) and 11(b) would then cut a channel in the support surface of the display material. Any number of slits or channels could then be cut out of either or both of the surfaces of the display means.

It will be appreciated that a cutting tool 9 having a plurality of blade means may be provided. Figure 9 is a side perspective view of a cutting tool means with six blade means. Such cutting tools with multiple blades would allow a plurality of slits or cuts to be made simultaneously in the support surface of the display material, by placing the guide means 13 in the equivalent number of flutes or corrugations and drawing the cutting tool towards the user.

In a preferred method of operation, the corrugated or fluted sheet material may be placed horizontally on a table or vertically on a support, and the cutting tool 9 may then be applied to the upward facing surface of the sheet material.

When required, the blades 11 may be removed and replaced.

In the preferred embodiment according to Figures 7, 8 and 9 the cutting tool has behind the leading edge of the blades a curved or arcuate recess such that when in use cut sheet material is caused to spiral up in the direction of

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arrow B. In this way clogging of the cutting tool is minimised. The cutting tool means may be used continuously and the cut material may be disposed of in any suitable way.

It will be appreciated that the cutting tool may be mechanised and be operated by any mechanised or automated machine, whereby blades are run across the sheet material to provide the necessary slits or channels.

It should also be appreciated that while the present invention has been described in various embodiments as modifying an existing corrugated or fluted sheet material, the invention is not restricted to this in any way.

It will be appreciated that corrugated or fluted material of the type described may be manufactured or formed from the outset with the preformed slits. In this case, the cutting of slits or channels might not be required.

Lastly, it should be appreciated that suitable sheet material may be formed by cutting corrugated or flute sheet material in half along the line C of Figure 4. In this way, essentially two usable sheets of material will be provided. Such a process may be more complicated if cutting needs to take place, but if it is formed in the first place, then the process will be simplified.

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Where in the foregoing description, reference has been made to specific components or integers of the invention having known equivalents, then such equivalents are herein incorporated as if individually set forth.

Although this invention has been described by way of example and with reference to possible embodiments thereof, it is to be understood that modifications or improvements may be made thereto without departing from the scope or spirit of the invention as defined in the appended claims.

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I CLAIM

1. A display means comprising corrugated or fluted sheet material having a display surface and a support surface, wherein one or both surfaces have a plurality of cut-outs or slits provided substantially in the same axis as the corrugations or flutes so as to enable said display means to be rollable.
2. A display means according to Claim 1 wherein cuts or slits are provided in selected corrugations or flute on both said surfaces of the said display means such that the cuts and slits are alternated on either surface.
3. A display means according to Claim 1 wherein the said cut-outs or slits have a width ranging from approximately 0.1 mm to 2 mm.
4. A display means according to Claim 1 in which the width of the cut-out or slit on one or both surfaces is varied to control the degree to which the sheet material may be rolled.
5. A display means as claimed in Claim 1 comprising corrugated or fluted sheet material having a display surface and a support surface in which one or both surfaces have a plurality of cut-outs or slits provided substantially in the same axis as the corrugations or flutes and wherein an adhesive means is applied to the display surface and thereafter a print or other image substrate is adhered to the display surface.
6. A display means according to Claim 5 in which said

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adhesive means comprises a carrier sheet coated on both sides with adhesive is applied to the display surface and thereafter a print or other image substrate is adhered to the display surface.

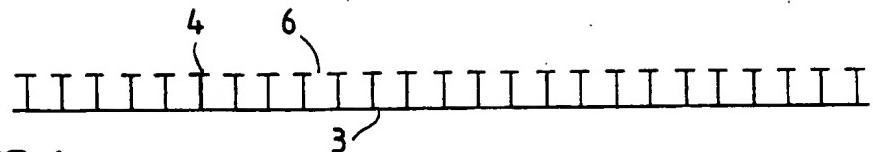
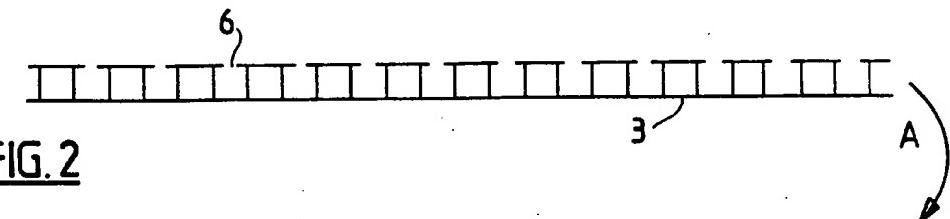
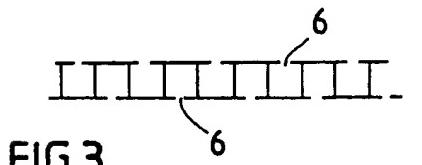
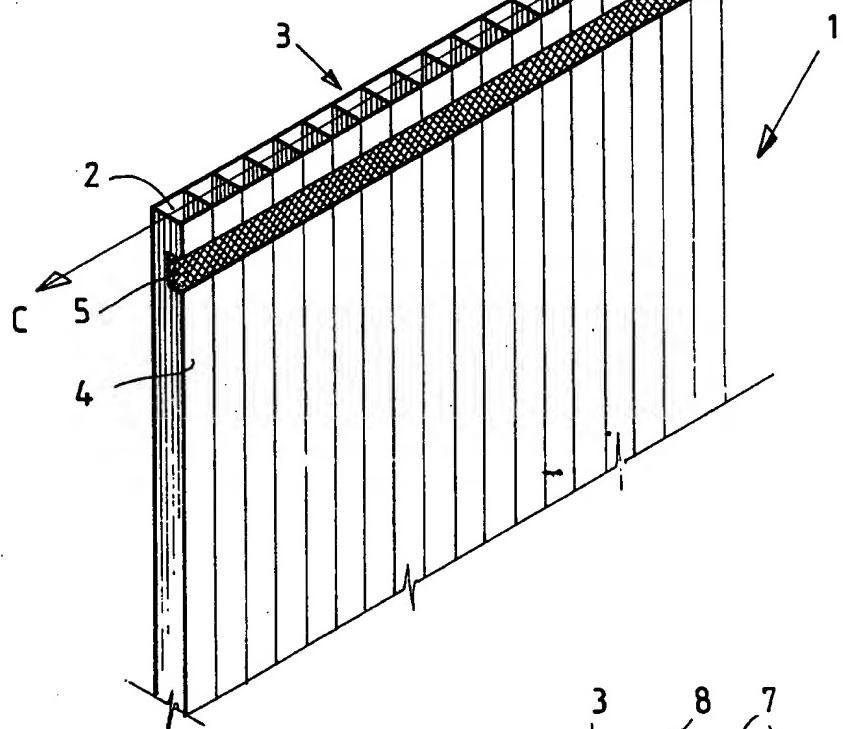
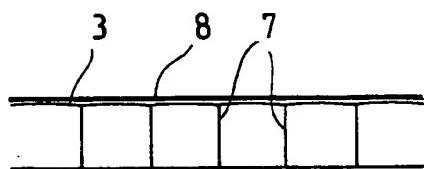
7. A display means according to Claim 7 in which the print or image substrate comprises a laminated material in which the grain of the said laminated material is substantially at right angles to the cuts or slits in the display means.
8. A panel means comprising corrugated or fluted sheet material wherein one or both surfaces have a plurality of cut-outs or slits provided substantially in the same axis as the corrugations or flutes so as to enable said panel means to be deformably erected.
9. A cutting tool for slitting or cutting a corrugated or fluted sheet material comprising a guide means, engageable within at least one corrugation or flute, and at least one blade means controllable by said guide means to engage with and slit or cut the or a respective corrugation or flute.
10. A cutting tool according to Claim 9 having a plurality of blade means positioned substantially parallel to each other and adapted to simultaneously cut or slit a respective one or a plurality of said corrugations or flutes.
11. A cutting tool according to Claim 9 wherein the or each blade means are positioned to allow variation in the

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size of the cut or slit in the or each corrugation or flute.

12. A cutting tool according to Claim 9 in which the angle of the or each blade means can be varied.
13. A cutting tool according to Claim 9 in which the or each blade means includes a curved or arcuate portion.
14. A cutting tool according to Claim 9 having a contoured material guide which forces material to spiral up such that the cutting tool does not become clogged.
15. A cutting tool substantially as hereinbefore described with reference to Figures 7 and 8 or 9 of the accompanying drawings.
16. A display means substantially as herein described with reference to any one of the embodiments shown in Figures 1 to 3, 4 or 5 or 6 of the accompanying drawings.
17. A panel means substantially as herein described.

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FIG. 1FIG. 2FIG. 3FIG. 4FIG. 5

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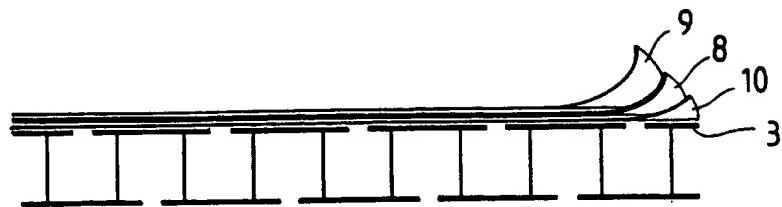


FIG. 6.

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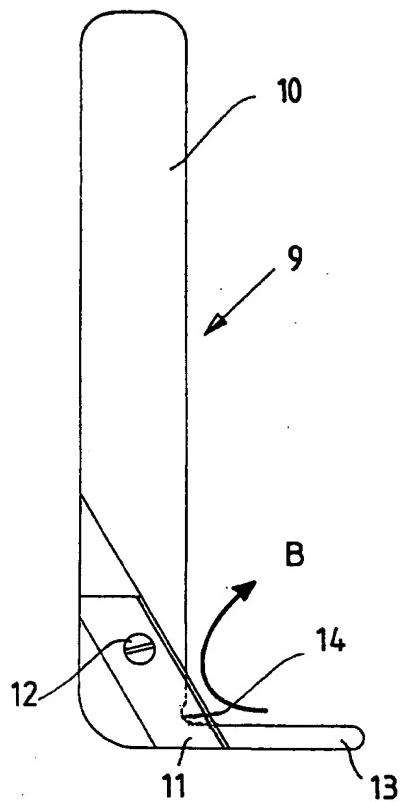


FIG.7.

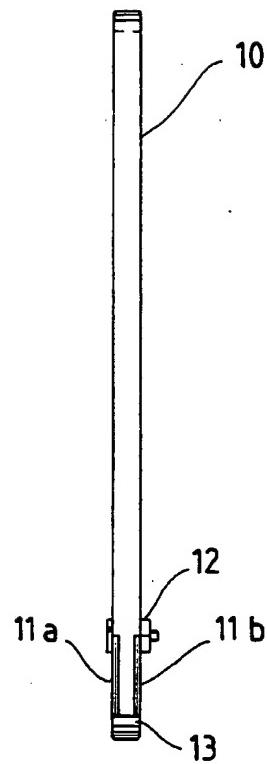
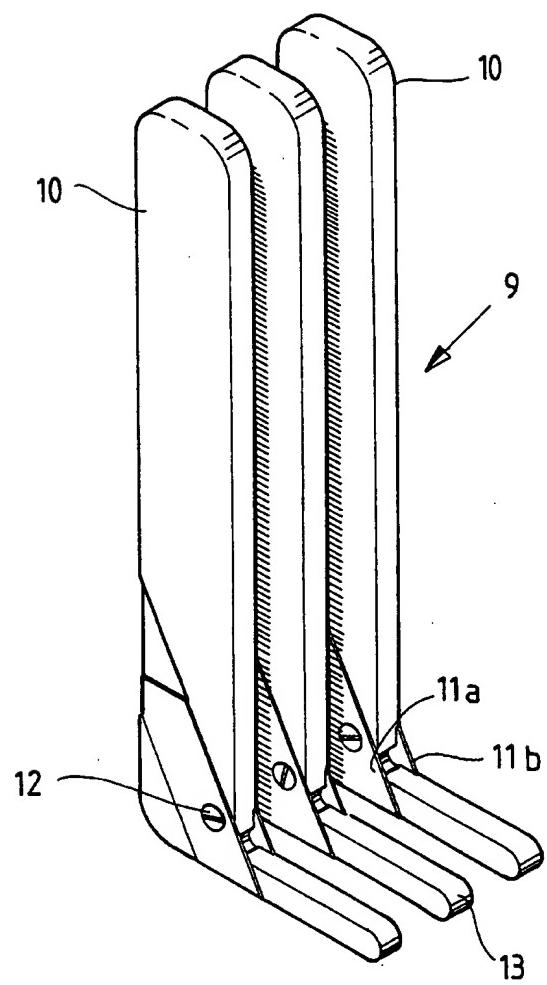


FIG.8.

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FIG.9

A. CLASSIFICATION OF SUBJECT MATTER
Int. CL⁵ G09F 7/00, 7/12, B26B 27/00, 29/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC G09F 7/00, 7/12, F16S 1/12, B26B 7/00, 27/00, 29/06

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
AU : IPC as above

Electronic data base consulted during the international search (name of data base, and where practicable, search terms used)
DERWENT WPAT : G09F, F16S, B26B, CUT, SLIT, PANEL, BOARD, SIGN, GUID:, CORRUGAT:, FLUT:

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to Claim No.
A	US,A, 4794712 (WOOD) 3 January 1989 (03.01.89)	1-8
X	AU,B, 3681/51 (151209) (JOHN CONNELL (BROMLEY) LIMITED) 6 September 1951 (06.09.51) column 2 line 13 to column 3 line 28 & figures 1,2	9-11,14
X	AU,B, 40497/58 (224388) (JECKER) 19 February 1959 (19.02.59) page 2 lines 15-19, page 3 line 29 to page 4 line 42 & figures 1-4	9,10,13,14
X	US,A, 2750668 (TARRAZI) 19 June 1956 (19.06.56) column 1 line 52 to column 2 line 57 & figure 1	9,10,14

Further documents are listed
in the continuation of Box C.

See patent family annex.

* Special categories of cited documents :	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle of theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means		
"P" document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 8 November 1993 (08.11.93)	Date of mailing of the international search report 11 NOV 1993 (11.11.93)
Name and mailing address of the ISA/AU AUSTRALIAN INDUSTRIAL PROPERTY ORGANISATION PO BOX 200 WODEN ACT 2606 AUSTRALIA Facsimile No. 06 2853929	Authorized officer  MALCOLM EASTHOPE Telephone No. (06) 2832212

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate of the relevant passages	Relevant to Claim No.
X	GB,A, 1524799 (MARTOR-ARGENTAX E.H. BEERMANN KG) 13 September 1978 (13.09.78) page 2 lines 52-66 & figure 1	9,10
X	AU,B, 19096/62 (268812) (NEEDLE INDUSTRIES LTD et al) 9 January 1964 (09.01.64) page 4 line 10 to page 5 line 16 & figures 1,2	9,10,13

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international search report has not established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:

2. Claim Nos.: 15, 16, and 17 because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

These claims do not comply with the requirements of Rule 6.2(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

- (i) Claims 1 to 8 relate to a display means
 (ii) Claims 9 to 14 relate to a cutting tool

as reasoned on the extra sheet:

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
 No protest accompanied the payment of additional search fees.

(continuation)

Box II continued

The international application does not comply with the requirements of unity of invention because it does not relate to one invention or to a group of inventions so linked as to form a single general inventive concept. In coming to this conclusion the International Searching Authority has found that there are two inventions:

1 Claims 1-7 and 8 directed to a display means or panel of corrugated or fluted sheet material having slits in the same axis as that of the corrugation or flutes. It is considered that the slits comprise a first "special technical feature".

2 Claims 9-14 directed to a cutting tool having at least one blade and a guide capable of engaging a corrugation or slit. The blade and guide are considered to comprise a second separate "special technical feature".

Since the abovementioned groups of claims do not share either of the technical features identified, a "technical relationship" between the invention, as defined in PCT rule 13.2 does not exist. Accordingly the international application does not relate to one invention or to a single inventive concept.